QUALITY CONTROL REPORTS FOR

SEMI DENSE BITUMINOUS CONCRETE

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC(QB)/2014-15

16.06.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	:	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	16.06.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	88	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	296	Min. 220

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/AIV/2014-15

16.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	16.06.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	390	391	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	302	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.56	22.76	**22.66**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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16.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
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Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	16.06.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	20.58	21.05	20.82

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Shape_T/2014-15 : 16.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	: Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	: EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 16.06.2014

Result : Flakiness Index = **11.05%**

Elongation Index = **13.15%**

Result : Combined Flakiness & Elongation index **24.20%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Shape_T/2014-15 : 16.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of Work	: Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	: EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 16.06.2014

Result : Flakiness Index = **12.85%**

Elongation Index = **13.90%**

Result : Combined Flakiness & Elongation index **26.75%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Stripping/2014-15 18.06.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the work	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	18.06.2014

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Sp_Wa/2014-15 18.06.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	18.06.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2023	2024	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1267	1268	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2024	2025	2025	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	757	757	756	
6	Weight of oven dried aggregate	W_4 g	2008	2014	2011	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.653	2.661	2.660	2.658
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.710	2.700	2.710	2.707
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.55%	0.70%	0.68%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Bit/2014-15 18.06.2014

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX AS per IRC:SP:-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
SAMPLE I/D	Roads in Vinayaka Layout 2nd Stage in Ward No.07.
DATE OF TESTING	18.06.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/Bit/2014-15 18.06.2014

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
NAME OF THE WORK	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
SAMPLE I/D	Roads in Vinayaka Layout 2nd Stage in Ward No.07.
DATE OF TESTING	18.06.2014

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	24.35	5.13	5.13	94.87	90-100
4.75	258.3	54.38	59.51	40.49	35-51
2.36	59.23	12.47	71.97	28.03	24-39
1.18	41.22	8.68	80.65	19.35	15-30
0.3	35.26	7.42	88.08	11.92	9-19
0.075	34.22	7.20	95.28	4.72	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	30.26	6.38	6.38	93.62	90-100
4.75	255.6	53.92	60.31	39.69	35-51
2.36	60.32	12.73	73.03	26.97	24-39
1.18	35.32	7.45	80.49	19.51	15-30
0.3	36.32	7.66	88.15	11.85	9-19
0.075	29.32	6.19	94.33	5.67	3-8

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Job No.: CTCE/BBMP/W.No07/RSCN/SDBC/AGG/2014-15

18.06.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. Ramsingh Chandra Naik,** Contractor, Bangalore.
Name of the Work	Improvements to Roads, Drains and Asphalting to roads in Vinayaka Layout 3rd Cross & 4th cross, 2nd Stage in Ward No.07, Byatarayanapura, BBMP, Bangalore.
Reference	EE/BTP/BBMP-E-PMT/156/2013-14 Dated: 09.10.2013
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	18.06.2014

Total Weight of Sample: **5100** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	350	6.9	6.86	93.14	90-100	
4.75	2510	49.2	56.08	43.92	35-51	
2.36	620	12.2	68.24	31.76	24-39	
1.18	480	9.4	77.65	22.35	15-30	
0.3	375	7.4	85.00	15.00	9-19	
0.075	385	7.5	92.55	7.45	3-8	

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	380	7.3	7.31	92.69	90-100	
4.75	2585	49.7	57.02	42.98	35-51	
2.36	880	16.9	73.94	26.06	24-39	
1.18	450	8.7	82.60	17.40	15-30	
0.3	385	7.4	90.00	10.00	9-19	
0.075	300	5.8	95.77	4.23	3-8	

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